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**Notes:**

1. Untranslatable words are replaced with asterisks (\*\*\*\*).
2. Texts in the figures are not translated and shown as it is.

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## CLAIMS

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**[Claim(s)]**

**[Claim 1]** In the database management equipment which manages the index key of each data which constitutes a database The registration data which registered the data corresponding to the index key registered into a database, The index key definition information that the setting range of an item name and a key value is defined about the index key set up when said registration data is stored in a database, and the index key to add, When it stores said registration data in a database, while outputting the item name which corresponds with reference to said index key definition information as an index key Database management equipment characterized by consisting of index key generation parts which determine the key value range of the item name which corresponds about the index key to add according to the key value range of the outputted index key, and output an index key.

**[Claim 2]** [ the range of the key value set as said index key definition information ] Specify the variable which shows that it is variable and [ said index key generation part ] Database management equipment according to claim 1 characterized by updating the key value range specified by said variable with reference to said index key definition information according to registration data, and generating the index key of the applicable range when it stores registration data in a database.

**[Claim 3]** [ the range of the key value set as said index key definition information ] Specify the formula containing the variable which is variable and [ said index key generation part ] Database management equipment according to claim 2 characterized by updating the key value range specified by said variable with reference to said index key definition information according to registration data and said formula, and generating the index key of the applicable range when it stores registration data in a database.

**[Claim 4]** In the database management equipment which manages the index key of each data which constitutes a database The registration data which registered the data corresponding to

the index key registered into a database, The index key definition information that the setting range of an item name and a key value is made to define about the index key set up when said registration data is stored in a database, and the index key to add, When it stores said registration data in a database, while making the item name which corresponds with reference to said index key definition information output as an index key The recording medium which recorded the program which makes a computer perform the index key generation part to which determine the key value range of the item name which corresponds about the index key to add according to the key value range of the outputted index key, and an index key is made to output.

## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the control of the index file which manages correspondence with the search key item in each data, and the field which stores data used when searching a database.

[0002]

[Description of the Prior Art] In control of a database, it is necessary to register conventionally the search key used for search of the data which data was registered and also was registered collectively. The control table of a search key is registered as an index table which manages the fields (storing page number etc.) which store the key item in data, and a corresponding data record, for example.

[0003] From managing the storing field of a key item and a corresponding data record collectively, when such an index table actually registers data into a database, it receives the key item in an index table. It is necessary to register the storing fields (storing page number etc.) where the data record was registered, and to secure the field for several key item minutes as a table data area.

[0004]

[Problem to be solved by the invention] In index table registration processing, when preparing beforehand the field only for several registration key item minutes and registering data into a database, a key item is extracted from each data and the storing field of the data record applicable to each key item is registered into an index table. Here, while extracting a key item from each data and registering as a key item in an index table when there is data already registered into a database, and registering with a database, the storing fields in a database (storing page number etc.) are registered collectively. However, an index table cannot be prepared, although extension of an index table is clear when adding data to the registered existing data. Moreover, since the data with which extending from the registered existing data

in the future is expected is the additional data from the existing data, it is continuation data with the same attribute as the existing data, and it is desirable to register index data using the existing data.

[0005]

[Means for solving problem] In the database management equipment which manages the index key of each data which constitutes a database in order that the invention in this application may solve the above-mentioned technical problem The data file which matches with an index key and is registered into a database, The key item name and start key of an index key which are set up when said registration data is stored in a database, Although there is still no data which sets up and registers the value of an end key, the index key definition information that the conditions of the range of the item name about the key which wants to add [ key ] to registration data like the schedule registration number of cases, and to generate an index key beforehand, and a key value were set up is prepared. When registering data into a database with reference to the prepared definition information, while generating the index key corresponding to registration data according to the specified conditions By determining the range of the key value of data to add the result processed by registration data to registration data like the schedule registration number of cases according to the setting range of a key value, and set an index key It makes it possible to generate efficiently about the index key added using the existing data. As a range of the key value of the index key to add, the variable defines a value which is determined by the existing data reading, when an index key is actually generated at the time of data registration, it is reflected in a variable, and the key value about the key item to add is determined. Moreover, it makes it possible to specify the formula which contains a variable about the key value of the index key to add, and the key value about the key item added by registering tendencies, such as a pace of expansion, as a formula is determined using the value updated when registering the past data.

[0006]

[Mode for carrying out the invention] Below, the form of operation of this invention is explained based on Drawings. The composition of the system of the invention in this application is shown in drawing 1 . One is database management equipment which manages the search key of the database to a database registered [ which were registered and was data-registered ] etc. among a figure. The database definition information shown in 2 is the information table which defined the item name of the database made applicable [ of database management equipment ] to management, the attribute, etc. The index definition registration part shown in 3 is what registers the information which defined the index key to generate. It sets up as index key definition information shown in 4 with reference to the information over the key item which corresponds with reference to database definition information, and also sets up as index key definition information by inputting the definition information about an index key generating from

a screen etc. The index key definition information shown in 4 is registered from the index key definition registration part shown in 3, and sets up a setup of a key, the storing conditions of a data record, etc. about an index key to generate. The index key generation part shown in 5 refers to the data registered into the index key definition information and database which were registered. While generating a key item, the key item which sets up and adds the storing field of the data applicable to a key item is generated according to the attribute of the set-up key. The registration data shown in 6 is data registered into a database, and consists of various data records corresponding to the key item and each key item which are extracted as an index key. The index key table shown in 7 is a data table which consists of a key item which is generated by the index key generation part shown in 5, and is used for a search key etc., and a storing field of a corresponding data record.

[0007] The database management equipment explained with the form of this operation shows the form realized by the computer program executed on the computer used for the general-purpose purpose, such as a personal computer and a workstation. Since it performs on a computer, the contents of registration to the database definition information 2 and the index key definition information 4 and a registration screen are inputted and outputted by the input/output device 8 of a keyboard and a display.

[0008] A computer consists of a processing unit, a main memory unit, an auxiliary memory, an input/output device, etc., execute a computer program, and [ a computer program ] It is stored in a main memory unit, an auxiliary memory, etc. of portability type media, such as a floppy disk and CD-ROM, or other computers by which network connection was made, and is provided. The offered computer program is loaded to the main memory unit of a direct computer from a portability type medium, or is once loaded to an auxiliary memory by the main memory unit after a copy or installation from a portability type medium, and is executed. Moreover, also when it is stored in other equipment by which network connection was made and is provided, it performs from other equipment by being loaded to an auxiliary memory by a copy and the main memory unit after reception via a network.

[0009] Next, drawing 2 and drawing 3 explain the database definition information and index key definition information which are used by this invention. Database definition information is constituted as shown in drawing 2, it does not register the definition information for every database, input it from the screen which the registration tool which an operator etc. does not specifically illustrate prepares, and it registers it, or corrects and registers the definition information itself by a direct editor etc. The database name 10 is the name of each database, and the index key item name 11 defines the attribute of the data with which the item name registered as an index key in each database and an attribute are registered into each item of an index key. For example, if it is an employee database, the employee number together put from an entrance fiscal year and a serial number before the end of the year will be registered

as an index key. "CHAR (2)" which shows the character code of double figures, and "CHAR (4)" which shows the character code of 4 figures to a serial number are set to an entrance fiscal year as a data attribute.

[0010] Next, the data structure of the index key definition information shown in drawing 3 is explained. It is what registers the attribute of the index key which in DEKKUKI definition information is constituted as shown in drawing 3, and is generated. Input from the screen which the registration tool which an operator etc. does not specifically illustrate prepares, and it registers, or the definition information itself is corrected and registered by a direct editor etc. The item name 13 is what specifies the item name made into an index key. When item names, such as a "fiscal year" and a "serial number", are directly registered into index key definition information and also it is beforehand set as the database definition information explained previously, it registers with reference to the index key of the database which corresponds by specifying a database name. An attribute 14 specifies the attribute of the item name made into an index key, and as database definition information explained previously, it specifies attributes, such as "CHAR (2)" which shows a character code and a digit number, and "CHAR (4)." About an attribute as well as an item name, it registers with index key definition information directly, and also registers with reference to the database information explained previously. Next, the start key value 15 and the end key value 16 specify the range of a key value to register about each item name registered as an index key. Next, the storing number of cases 17 specifies and stores the following page, when exceeding the storing number of cases as which the record number of cases storable in 1 page is specified, and the storing record was specified about the storing field of the data record corresponding to an index key. In this example, although specified by the storing number of cases to each page, in a variable-length case, the data record stored in each page cannot store the same number of cases in the page of fixed length. Therefore, you may set up by "the usage rate in a page" as it stores in the following page, if stored to what% of the page size instead of the storing number of cases. Next, it is what specifies whether a storing field is changed when it changes, a point 18 stores a data record to an index key and the value of a key item changes. If the value of the index key item as which the change was specified is updated when those with a change are specified, even if it is under the storing number of cases to a page, as the remainder sets up a dummy record, the data to the updated index key item is stored after the following page. For example, when a fiscal year changes for the purpose of managing two or more data records collectively about each fiscal year and it changes a storing page, it specifies. When the change is specified to the index key item of a "fiscal year" Storing processing of the data about "97" finishes, when the following data is data corresponding to "98", even if the value over a key item "fiscal year" is still storable in the page for storing, it registers a dummy record, and the data corresponding to "98" is stored in the following page. Next, the dummy record number of cases 19 specifies

the dummy record number of cases generated when the key item specified on the change point 18 is changed. For example, when specifying it that it generates an index key table also about the data for the current fiscal year which does not still have a track record in registering the track record data by the last fiscal year into a database, the dummy record number of cases for the current fiscal year which wants to generate a constant beforehand is registered. Moreover, also about the track record data by the last fiscal year, when outputting a dummy record at a given fiscal year, it registers.

[0011] Next, the example of database definition information explained by drawing 2 and the example which set up information based on the index key definition information that it explained by drawing 3 are used, and the flow of processing of the invention in this application is explained. First, according to the example of index key definition information (1) and the example of registration data (1) which are shown in drawing 4 and drawing 5, the flow of the processing which generates the example output (1) of the index key table shown in drawing 6 is explained. The index key table explained with the form of this operation shall manage the key items 31 and 32 for every page of a data storage field, and each key items 31 and 32 shall set up the maximum key value of each page 33. Moreover, real data is stored in the data area which an actual page has a position managed with each pointer 34, and a pointer 34 specifies.

[0012] In order that this example may manage the data on the employee database who manages the information about an employee, The index key table which manages the page which generated the employee number which consists of serial numbers at a fiscal year and a given fiscal year as an index key, and stored the corresponding data record is created. [ the generation conditions of the index table in this example ] Since employees do not increase in number about the employee of the past fiscal year after this, Index key data creates the record number of cases storable in each page, registers it for every corresponding index key, and the page number which registered each record [ new year ] By making the schedule adoption number specify, it specifies adding a fiscal year one time after the last key value of the past fiscal year, and generating the key for several Sadato minutes as index data beforehand.

[0013] First, according to drawing 10, the flow of the registration processing to index key definition information is explained. In registration of index key definition information, first, a database name is specified (S61) and the item name of the index key corresponding to the specified database name and an attribute are reflected in index key definition information with reference to the database definition information shown in drawing 2 (S62). As shown in drawing 4, "CHAR (2)" and "CHAR (4)" are set up as a "fiscal year", a "serial number", and an attribute 22 as an item name 21. Although the database definition information which defined the item name which each database constitutes beforehand, the attribute, etc. by this example is registered and being referred to database name specification, you may specify an item

name and an attribute as index key definition information.

[0014] Next, the key generation conditions about the employee of the fiscal year of the past which data has already decided are registered (S63). Since the data registered to a database about the employee of the past fiscal year already exists, about what is determined about the start key value 23 and the end key value 24 at the time of registration data reading, it sets up as variable data. Although a serial number sets up "0001" which is a start number in this example Since the fiscal year of the oldest employee number in registration data serves as a start key value about the fiscal year which constitutes an employee number, "LOW-VALUE" which is variable data as index key definition information is set up, and a start key is set up according to the fiscal year in registration data at the time of data registration. Moreover, since even 97 years are the past data about an end key value, Since "97" is set as a fiscal year and, as for a serial number, the last serial number in the employee number in the 97 fiscal year serves as an end key value, "HIGH-VALUE" which is variable data as IDDEKKU skiing definition information is set up, and an end key is set up according to the last serial number of the employee number in the 97 fiscal year in registration data at the time of data registration. Next, "90" is set up as the storing number of cases 25, and "30" is set up as the dummy record number of cases 27. Moreover, an item name "fiscal year" is set up as a change point 26. By the above setup, when it stores 90 affairs at a time each data record corresponding to an index key to each page and there is a change of a fiscal year, 30 dummy records are secured.

[0015] Next, the key generation conditions to add are registered (S64). About the item name and attribute which are made into an index key, since it is appropriation of the past fiscal year, it does not set [ employee / who adds / of a fiscal year ] up. As for "98" and a serial number, "0001" is set up about the fiscal year which constitutes a start key value about the start key value 23 and the end key value 24 since it is data of the next fiscal year of the employee data of already defined existing which is additional data. Moreover, "1000" which is the schedule adoption number is set to an end key value. Although "98" is made to specify as a start key value of an additional index key beforehand in this example Since it turns out that the end key value of the existing employee number is "97" at the time of the existing data registration, The fiscal year of the end key value of the existing data is set up with the variable item "VALUE", and you may set up with "VALUE+1" which shows that it is the next year of the fiscal year of the end key value of registration data about the fiscal year of the start key value of additional data. By setting up index key definition information as mentioned above, [ information / by 97 / employee ] Generate the index key value which set "97" as the key item "fiscal year" according to the key item in registration data, and it registers with an index key table. The start key value over the schedule adoption number in the 98 fiscal year generates the index key value which set "98" added to "97" which is the generated end key value one time to the key item "fiscal year." Next, "90" is set up as the storing number of cases 25 in page data, and "1000" is set up

as the dummy record number of cases 27. Moreover, change specification to an item name is not performed. By the above setup, it stores 90 affairs at a time each data record corresponding to an index key to each page, and it secures the dummy record of 1000 affairs on the whole.

[0016] Next, the flow of index key generation processing according to the registered index key definition information is explained according to drawing 13 from drawing 11. In index key generation processing, the index key definition information registered first is read (S65). The definition information about the registration data 6 that index key definition information is the past employee information as first entry data is set up. Since the definition information about the dummy record generation for the schedule adoption number added as following entry data is set up, the definition information in the case of registering the past employee information is read first. Next, the registration data to an index key table is initialized. An index key value makes an initial value the value specified as the start key value for index key definition information, and 0 is set as the page number of the data record to store as the storing number of cases in 1 and a page (S66). Next, the registration data about the existing employee number is read from the registration data 6 (S67). Registration data is data constituted like the example of registration data of drawing 5 (1). The variety of information to an employee is registered as data besides the data used as key items, such as a "fiscal year" and a "serial number", and data is stored in the storing field (page number) of a data record whenever it reads each data. Next, the existence of a change setup of index definition information is judged (S68). Since it is necessary to change a storing page when the value of a key item changes with the last processing value in with a change, it is judged whether the item key made applicable to a change differs from a value last time (S69). In order to secure the dummy record for the dummy record number of cases specified by the judgment for index definition information when the change of a page was required, dummy record generation processing is called (S70). Next, it judges the data of how many affairs was already stored in the page (S71). Since the key item processed last time serves as the maximum key value in a page when the real storing number of cases to last time is in agreement with the storing number of cases in a page, the key item corresponding to the maximum key value corresponding to each page is written in the index key table 7. With the form of operation of an application concerned, the pointer to the page number and the applicable page which correspond while writing in a key item is written in. Moreover, during processing, since it will store in the following page, data clears the real storing number of cases in a page while updating data storage page number to the following page number (S72). Next, while storing in the page which the key item was updated [ page ] and had correspondence data specified about data during processing, the real storing number of cases into a page is added one time (S73). As mentioned above, even the last record repeats [ employee / as shows the example of the existing data (1) as shown in

drawing 5 / existing ] processing about information (S74). For example, [ data / as shown in drawing 5 / registration ] if sequential operation is repeated from "90 (fiscal year)" of eye one record, and "0001 (serial number)" [ in the place which read "90 (fiscal year)" of eye 91 records, and "0091 (serial number)" ] since the storing number of cases in a page is 90 affairs. The last real storing number of cases is compared with the storing number of cases in a page, and since it is in agreement (S71), index key table writing will be performed about the page number 1 (S72). Therefore, "90" and "0090" are set up as a maximum key item of the page number 1 as the fiscal year 31 which is a key item like the index key table example output (1) shown in drawing 6, and a serial number 32. Although "01" does not illustrate again as page number 33 which is a correspondence data position, the pointer corresponding to a page is set up. Although a specific value is not set to a "fiscal year" as a start key value but "LOW-VALUE" is set up for index key definition information, the "fiscal year" of a start key value is set to "90" like this example with the read data at an index key table. By repeating the above processing, processing to the final data "500" about "90" is repeated for a "fiscal year", next "91 (fiscal year)" of eye 501 records and "0001 (serial number)" are read (S67). Next, a change setup is judged to be \*\*\*\* about a key item "fiscal year" (S68). Since the "fiscal year" data which is a change item key changed from the processing value "90" to "91" last time (S69), it directs to output the dummy record of 30 affairs which is the number of cases specified as the page which stored the data in the 90 fiscal year for index key definition information (S70). If a field is secured in page data by 30 specified dummy record cases by dummy record generation processing so that it may mention later, as shown in drawing 6, "90" and "0530" will be written in an index key table as a maximum key item of the page number 6 as a fiscal year 31 and a serial number 32. Finally renewal of a key item and storing number-of-cases addition processing to an applicable page are performed about the data of "91 (fiscal year)" and "0001 (serial number)" under present processing (S73). When even the last record of the existing data repeats the above processing, the maximum key item of each page is registered into an index key table about the data corresponding to the existing employee number. Moreover, although a specific value is not set to a "serial number" as an end key value but "HIGH-VALUE" is set up for index definition information by reading "97 (fiscal year)" and "0800 (serial number)" as the last registration data. With the read registration data, the end key value "serial number" of an index key table is set to "0800" like this example.

[0017] Next, in order to perform index key generation processing of additional data, the next entry information on index key definition information is read (S75). With reference to the start key of the key item registered for index key definition information, in being a candidate for a page change, it generates a dummy record (S76). Next, in the read index key definition information which was set up about the attribute of the data to add. When there is a variable value as which the contents determine the existing data according to the data registered as an

index key table, a variable value is updated according to the contents which processed the existing data (S77). For example, the fiscal year of the end key value of the existing data is set up with the variable item "VALUE" as a start key value of an additional key. If it sets up with "VALUE+1" which shows that it is the next year of the fiscal year of the end key value of registration data about the fiscal year of the start key value of additional data, "98" added to "97" which is an end key value one time by this processing in the "fiscal year" of the start key value of an additional item will be set up. Finally a dummy record is generated according to a start key value, an end key value, and the dummy record number of cases about additional data (S78). For example, since "98" is specified as the start entry in the following definition information and "97" and the fiscal year which are the end key of the existing data have changed if it is the example of a definition shown in the example of index key definition information (1) shown in drawing 4, it is the target of a page change. Therefore, as the flow of the index key generation processing shown in drawing 11 explained as a flow of processing with a change setting, after adding a dummy record to the data of "97" fiscal years, the dummy record generation processing for the specification number of cases is specified about "98" fiscal years which are an additional fiscal year.

[0018] Next, the flow of generation processing of a dummy record is explained using drawing 13. A page change and the dummy record specified about additional data read first the record number of cases specified for index definition information (S80), and performs generation processing for the read number of cases. Since the number of cases storable in each page is specified, the number of cases and the page storing number of cases which were actually stored are compared (S81). When the number of cases which already performed write-in processing is in agreement with the number of cases storable in a page, the key item corresponding to an applicable page is written in into index definition information, the following page number is specified, and the storing number of cases in a page is cleared (S82). Next, a dummy record is outputted to the specified page, a corresponding key item is updated, and it adds to the storing number of cases one time (S83). The dummy record number of cases finally specified at the head is subtracted (S84), and it repeats by the dummy record number of cases which had the above processing specified (S85). After processing for the specified dummy record number of cases is completed, the last key item of the page which secured the dummy record is written in an index key table, and page number and the storing number of cases are updated so that the following storing page may be specified (S86).

[0019] Next, it explains using drawing 7, drawing 8, and drawing 9 focusing on the portion which is different from the processing which already explained the example which manages an employee number (serial number) as an index key for every corporate code for a database which manages the employee number of each company. Whenever it uses the old number of employees which has already existed as registration data and a corporate code is specified at

the time of a new business start etc. Based on the old data of an applicable company, the index key data for several worker minutes with which an enterprise pace of expansion is specified and an addition is expected is generated automatically.

[0020] First, according to the flow of the registration processing to the index key definition information that it explains to drawing 10, index key definition information as shown in drawing 7 is set up. As shown in drawing 7, "CHAR (4)" which shows the character code of 4 figures as a "corporate code", an "employee serial number", and an attribute 42 as an item name 41 of an index key is set up. Next, the key generation conditions of the employee serial number for every existing company which data has already decided are registered (S63). Although "A001" which shows a corporate code, and "0001" which is a first number are set up, and the corporate code is common, since the start key value 43 is judged by the end key value 44 about a serial number at the time of reading of the existing registration data, it sets "HIGH-VALUE" to it as variable data. Next, "40" is set up as the storing number of cases 45, and "10" is set up as the dummy record number of cases 47. In storing 40 affairs at a time each data record corresponding to an index key to each page and changing a page by the above setup, it stores ten dummy records.

[0021] Next, the key generation conditions to add are registered (S64). [ value / 24 / the start key value 23 and / end key ] Since it is the next data of the employee serial number of already defined existing which is additional data, about the corporate code which constitutes a start key value, "HIGH-VALUE +1" which is the next value of the end key value of the data which registered "A001" and a serial number is set up. Moreover, since the number of additional keys is computed by seasoning the existing number of employees with an enterprise pace of expansion, it sets to an end key value with "HIGH-VALUE\*0.2" as an employee serial number of the end key value of the existing data. The numerical value which considered the enterprise pace of expansion by the above-mentioned setup to the number of whole employee persons calculated from the end key value at the time of creating an index key according to registration data is set up as an additional in DEKKUKI value.

[0022] Next, the flow of index key generation processing according to the registered index key definition information is explained according to drawing 13 from drawing 11. In index key generation processing, the registration data about the existing employee number is read from reading (S65) of the index key definition information registered first and the registration data 6 (S67). Registration data is data constituted, for example like the example of registration data of drawing 8 (2), and whenever it reads each data, it sets an index key and the storing field (page number) of a corresponding data record as an index key table. [ what even the last record repeats processing for (S74) ] according to the example of registration data as shown in drawing 8 [ eye "A(corporate code) 001" of eye one record, and "0001 (employee serial number)" to 40 records ] It is stored in the page number 1 and "A001" and "0040" are set up as

a maximum key item of the page number 1 as the corporate code 51 which is a key item like the index key table example output (2) shown in drawing 9, and an employee serial number 52. "01" is outputted as page number 53 which is a correspondence data position. The above processing is repeated to the last of the registration data about the same company code, and an IDEKKU skiing table is outputted. It shifts to processing of additional data after processing the data of the employee serial number "0500" which is data of the last of the existing data.

[0023] Next, in order to perform index key generation processing of additional data, the next entry information on index key definition information is read (S75). In order to generate an additional key from the next of the end key value of the existing data by this example with reference to the start key of the key item registered for index key definition information, it is not the target of a page change and a dummy record is not generated (S76). next, [ value / which is a variable value as which the contents determine the existing data according to the data registered as an index key table / start key ] In this (S77) example which sets up the value added to the end key value of the existing data one time, since "500" was set up as an end key value of the existing data, the start key value of additional data is set to "501." Moreover, since it is set up with "HIGH-VALUE\*0.2" which shows that an end key value is twenty percent of the number of cases of the end key value of the existing data, it means that 100 affairs were set up as the additional number of cases. Since an end key value is decided by adding 100 affairs specified as the additional number of cases to a start key value, a dummy record is generated according to a start key value and an end key value (S78). Therefore, as a result of processing 100 affairs of an addition record, it is outputted as shown to drawing 9 in "A001" and "0600" as a maximum key item corresponding to the page number 15 which stored the last record.

[0024]

[Effect of the Invention] While generating the index key which manages a search key item and the field which stores corresponding data according to the invention in this application when registering data into a database as explained above By using the result of the IDDEKKU skiing value generated at the time of data registration, it becomes possible to generate the index key to additional data efficiently. Moreover, since additional data is data extended from the existing data, Registration data seems to increase in many cases by the fixed pace of expansion from the track record data of the past continued or shown with an end value so that it may start from the next value of the end value of the index key value which additional data registered, since the attribute is common. Therefore, by specifying the key value at the time of the registration to a database in a variable and a formula in the invention in this application as conditions for which an additional index key value is generated It becomes possible to generate the additional index data of being extended in fixed quantity from the past data which is continuing from the registered data.

[Translation done.]